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EXAMINER

QUAN, ELIZABETH S

ART UNIT	PAPER NUMBER
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1743

DATE MAILED: 04/23/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/873,176

Applicant(s)

SAFIR ET AL.

Examiner

Elizabeth Quan

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 20 January 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-85 is/are pending in the application.
- 4a) Of the above claim(s) 69-85 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-12, 14-19, 21-25, 27-29 and 31-68 is/are rejected.
- 7) ☒ Claim(s) 13, 20 and 26 is/are objected to.
- 8) ☒ Claim(s) 1-85 are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 01 June 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 10/23/02 & 1/15/02.
- 4) ☒ Interview Summary (PTO-413)  
Paper No(s)/Mail Date 04122004.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Election/Restrictions***

1. In the previous Office Action mailed 1/20/2004, Examiner inadvertently placed method claim 69 into group I for apparatus when it was intended that it be placed into group II.

Examiner thanks the Applicant for responding expeditiously to the mistake. The Office regrets the inconvenience this has caused the Applicant.

2. Restriction to one of the following inventions is required under 35 U.S.C. 121:

- I. Claims 1-68, drawn to a parallel, semi-continuous or continuous pressure reactor, classified in class 422, subclass 99.
- II. Claims 69-85, drawn to a method for effecting chemical reactions in parallel, classified in class 436, subclass 180.

The inventions are distinct, each from the other because of the following reasons:

3. Inventions II and I are related as process and apparatus for its practice. The inventions are distinct if it can be shown that either: (1) the process as claimed can be practiced by another materially different apparatus or by hand, or (2) the apparatus as claimed can be used to practice another and materially different process. (MPEP § 806.05(e)). In this case the apparatus as claimed can be used to practice another and materially different process, such as feeding gases or solids through the feed lines to each of the reactors instead of feeding liquid reagents as recited in claim 69; performing the method steps without the step of pre-feeding as recited in claim 70; and without the steps of controlling the total volume being fed to each reaction vessel during the reaction, number of stages in which the total volume for each of the liquid reagents are fed to the reaction vessel during the reaction, stage volume defined by a percentage of the total volume

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associated with each of the stages for each of the liquid reagents, feed sequence defined by a relative order in which the stages for each of the liquid reagents are fed to the reaction vessel during the reaction, and a temporal profile associated with feed addition to the reaction vessel for each of the stages for each of the liquid reagents as recited in claim 71. Regarding method claim 69, method claims 70 and 71 are evidence that the apparatus can be performed with a different method other than that recited in claim 69.

4. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.

5. Because these inventions are distinct for the reasons given above and the search required for Group I is not required for Group II, restriction for examination purposes as indicated is proper.

6. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art because of their recognized divergent subject matter, restriction for examination purposes as indicated is proper.

7. During a telephone conversation with Brian P. Klein on 4/14/2004 a provisional election was made with traverse to prosecute the invention of I, claims 1-68. Affirmation of this election must be made by applicant in replying to this Office action. Claims 69-85 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

Applicant is advised that the reply to this requirement to be complete must include an election of the invention to be examined even though the requirement be traversed (37 CFR 1.143).

8. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

***Information Disclosure Statement***

9. The information disclosure statement filed 1/15/2002 fails to comply with 37 CFR 1.98(a)(3) because it does not include a concise explanation of the relevance, as it is presently understood by the individual designated in 37 CFR 1.56(c) most knowledgeable about the content of the information, of each patent listed that is not in the English language. EP 658566 A1 to Chatelain et al. and Nelles et al.'s document in *Chem Tech* have been placed in the application file, but the information referred to therein has not been considered.

10. The information disclosure statement filed 1/15/2002 fails to comply with the provisions of 37 CFR 1.97, 1.98 and MPEP § 609 because copies of the non-patent literature were not received. RoboSynthon, Inc.'s "MultiReactor-Reactor Block" and J-KEM Scientific Inc.'s "Reaction Blocks" have been placed in the application file, but the information referred to therein has not been considered as to the merits. Applicant is advised that the date of any re-submission of any item of information contained in this information disclosure statement or the submission of any missing element(s) will be the date of submission for purposes of determining

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compliance with the requirements based on the time of filing the statement, including all certification requirements for statements under 37 CFR 1.97(e). See MPEP § 609 ¶ C(1).

### *Drawings*

11. The drawings are objected to because they do not show the at least one feed-pressurization station in a connecting relationship with the reaction vessels each with an impeller. For example, fig. 2E shows a feed-pressurization station (1205) in a flow diagram and fig. 5A shows reaction vessels each with an impeller in an actual drawing, such that it is unclear how they relate with one another. Additionally, the relationship between the shaft and shaft cover should be shown. A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

12. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the lower portion of the reaction cavity with a circular cross section and upper portion of the reaction cavity with an oval cross section as recited in claim 20, the first section of the feed line positioned such that at least a portion thereof is inside a reaction cavity as recited in claim 25, shaft covers as recited in claim 49, disposable header gasket with four or more masking regions corresponding to the four or more reaction cavities with the masking regions adapted to mask the portion of the header block exposed to the reaction cavity must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

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A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

### ***Claim Objections***

13. Claims 7, 10, 35, 36, 63, 64 are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. Claims 2 and 3 already recite four or more semi-continuous or continuous reaction vessels as claimed in claim 7, which depends from claims 2 and 3. Claim 3 already recites four or more semi-continuous or continuous reaction vessels as claimed in claim 10, which depends from claims 3 and 8 in which claim 8 depends from claim 3. Claim 1 already recites four or more semi-continuous or continuous reaction vessels as claimed in claims 35 and 36, which depends from claim 1. Same type of problem in claims 63 and 64.

### ***Claim Rejections - 35 USC § 112***

14. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter, which the applicant regards as his invention.

15. Claims 4, 6, 23 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

16. Where applicant acts as his or her own lexicographer to specifically define a term of a claim contrary to its ordinary meaning, the written description must clearly redefine the claim

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term and set forth the uncommon definition so as to put one reasonably skilled in the art on notice that the applicant intended to so redefine that claim term. *Process Control Corp. v. HydReclaim Corp.*, 190 F.3d 1350, 1357, 52 USPQ2d 1029, 1033 (Fed. Cir. 1999). The term “waste vessel” in claims 4, 6 is used by the claim to mean “a vessel for which the liquid feed lines are pre-pressurized”, while the accepted meaning is “a vessel for holding waste.” The term is indefinite because the specification does not clearly redefine the term. Furthermore, it does not make sense that liquid is fed through the waste vessel before being fed into the reaction wells since it would introduce contaminants into the reaction wells.

17. Claim 25 is rendered indefinite since the first section of the feed line as denoted by reference character (300a) does not appear to have a portion that is inside the reaction cavity. See fig. 6a of the instant application.

### ***Claim Rejections - 35 USC § 103***

18. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

19. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.



20. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

21. Claims 1-12, 19, 21-25, 27-47, 49-68 are rejected under 35 U.S.C. 103(a) as being unpatentable over EP 0 635 713 to Hutchins et al.

Hutchins et al. disclose a parallel, semi-continuous or continuous, pressure reactor (25) (figs. 1-6). A reactor block comprises a base block (26) and header block (30) (figs. 1-6; col. 3, lines 42-49). The base block comprises six semi-continuous or continuous reaction wells (31) for containing a liquid reaction mixture (figs. 1-6; col. 3, lines 42-49). The reaction wells are hermetically sealable or capable of being hermetically sealed. The reaction wells may also be considered the reaction vessels (figs. 1-6). The reaction wells are defined by an upper portion in the reactor block (figs. 1-6). The cylindrical reaction well has a substantially uniform cross-section with the upper and middle portions of each reaction well having a larger cross section relative to the respective very small portion of the lower portion of the reaction well since the bottom portion is curved (fig. 2). The header block is positioned over the base block (figs. 1-6). A control head (38), which may be considered a ferrule, is mounted over each of the wells (31) on the base block (figs. 1-6; col. 3, lines 54-56). Six shaft-driven impellers (33) correspond to the six reaction vessels for stirring the reaction mixtures (figs. 1-6; col. 3, lines 49-53). Part of

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the shaft is masked by a shaft cover either by projecting through the control head or drive assembly (35) or covered by a polygonal piece near the drive assembly (fig. 2). A control unit (11) includes a cabinet (12) with a plurality of fluid pumps (13), liquid filter holding mechanism (14) and dispenser mechanism (15) for dispensing filters into the filter holding mechanism (14) (col. 3, lines 30-34). Liquid communication between the control unit and each of the control heads is provided by one of the line sets (20), each of which includes a wash line (16), sampling line (17), waste aspirate line (18), and media fill line (19) (col. 3, line 56-col. 4, line 2). Each control head includes a spray wash tube (39), which is connected to the wash line, media fill tube (41), which is connected to the fill line, aspiration probe (42), which is connected to the aspirate line, sampling probe (43), which is connected to the sampling line, and pH adjustment and media replacement tube (44), which is connected to a pH adjustment and media replacement line (45) (col. 4, lines 6-22). The control unit with the cabinet is considered a parallel feed-line interface providing fluid communication between first section, which are the tubes (39,41,44), and second sections, which are the lines (16,19,45), of each of the feed lines since provides instructions for forcing liquid from the second section into the first section (figs. 1-6). The interface is connected to the first section via the second section of each of the feed lines (figs. 1-6). The lines (16,19,45) have a substantially circular cross-sectional area (fig. 2). The lines appear to have different inside diameters or cross-sectional flow areas (fig. 2). A sample tablet dispenser (57) is mounted on the control head (col. 4, lines 23-25). A wash nozzle (63), outwardly directed fill nozzle (61), aspiration tip (62), sampling tip (64), and outwardly directed adjustment and replacement nozzle (65) are attached to the lower ends of the wash tube (39), fill tube (41), aspiration probe (42), sample probe (43), and adjustment and replacement tubing (44),

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respectively (col. 4, lines 25-34). Each of the media fill line (19), wash line (16), and pH adjustment and media replace line (45) is in fluid communication with its own reagent source, such that one or more reagents can be selectively fed to each of the six reaction wells during a reaction under reaction conditions (fig. 6). The reaction wells are considered to be in direct fluid communication with a liquid reagent source since there is a direct path by which liquid from a source travels to the reaction wells (fig. 6). There are valves (101,102,111,105,106,108,109,144,146) that provide selective fluid communication between the liquid sources and feed lines for each of the reaction wells (fig. 6). The media fill line (19), wash line (16), and pH adjustment and media replace line (45) are in selectable fluid communication with media pump (94) and syringe pumps (142,143), which are considered the feed-pressurization stations that are capable of pressurizing the liquid sources (fig. 6). The feed lines can prefeed the liquids to the stations under pressure to prepressurize the feed lines prior to feeding the liquids to the reaction wells. Since it is unclear how a *waste* vessel is structurally different from an ordinary vessel as the term is considered a recitation of intended use and unclear, the pumps and manifolds may be considered *waste* vessels at which pressurization is performed. The reactor block has control elements (46,66) for individual or modular temperature control of the reaction vessels (figs. 1-6; col. 4, lines 23-34).

Each of the reaction wells has at least two gaseous ports one of which is for the sample line (17) and the other of which is for the waste aspirate line (18) (fig. 6). Wastes and samples are removed by energizing pumps (95,96) to provide a pressure to force or purge the contents of the reaction wells into the detector or waste vessel, thus affording the descriptive label *gaseous* or *gaseous purge* (col. 6, lines 14-49). Nevertheless, *gaseous* or *gaseous purge* is considered a

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recitation of intended use. A recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. In a claim drawn to a process of making, the intended use must result in a manipulative difference as compared to the prior art. See *In re Casey*, 152 USPQ 235 (CCPQ 1967) and *In re Otto*, 136 USPQ 458, 459 (CCPA 1963). In this case, these ports and the other ports used for dispensing liquid and solid are capable of dispensing gas or purging gas from the reaction wells. Furthermore, it is inevitable to dispense or purge some gas along with the liquid and solid, such that they are in the form of air bubbles. Since claims 37-40 are directly dependent on independent claim 1, these gaseous ports or gaseous purge ports may also be considered as discharge lines. Nevertheless, it would have been obvious to one having ordinary skill in the art to provide each reaction well with a pressure monitoring port, gaseous feed ports, gaseous purge ports to supply adequate conditions for the assay while preventing over pressurization and explosion of the reaction wells.

It appears that the feed lines, which are considered to be the second sections, are releasably engaged from respective tubes, which are considered to be the first sections. The first sections generally are positioned outside the reaction vessels (figs. 1-6). The first sections extend through the control head and connect with distal ends, which are in the form of nozzles that are positioned within the reaction wells (figs. 1-6). Some of the distal ends are positioned lower in the reaction well relative to other distal ends such that feed is delivered into the reaction vessel above the mixture into a gaseous headspace (figs. 1-6). The air or gaseous atmosphere above the mixture is considered the gaseous headspace, which is defined as the space above a

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mixture of an almost filled container (see <http://www.dictionary.com>). The first sections are additionally *or* alternatively substantially uncontaminated by the mixture in the reaction vessels. Nevertheless, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the reactor of Hutchins et al. to make the first sections releasably engaged with the second sections to allow replacement of damaged or contaminated lines to render the reactor reusable for subsequent different assays.

It is unclear if the interface is *releasably* connected to the first and/or second section of each of the liquid lines. However, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the reactor of Hutchins et al. to provide an interface that is *releasably* connected to the first and/or second section of each of the liquid lines to allow replacement of damaged or contaminated lines, tubes, ferrules, and impellers to render the reactor reusable for subsequent different assays.

It appears that the apertures sealing support the at least two feed lines when the ferrule is engaged with the reactor block. Nevertheless, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the reactor of Hutchins et al. to provide the ferrule with apertures sealingly supporting the feed lines to prevent leaks.

It appears the control head releasably engages the reactor block since figs. 3-5 show the control head removed from the reactor block and the control head appears to be a separate part aside from the header block and base block. Nevertheless, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the reactor of Hutchins et al. to make the control head removable from the reactor block to allow thorough

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hands-on cleaning of the reaction vessel and impeller, aid in agitating the contents of the reaction vessel, supply last minute agents to the reaction vessels, and make storage of the reactor easier.

It appears that the stations are pressurizable to a pressure of not less than about 50 psig since pumps are well known to pressurize at such common pressures. Nevertheless, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the reactor of Hutchins et al. to provide a pump capable of providing pressures of at least about 50 psig to efficiently force liquid into reaction vessels and provide the required pressure to perform an assay.

It appears that each of the reaction vessels is capable of being pressurized to a pressure of at least 50 psig, 100 psig, or 400 psig or between about 500 psig to about 1500 psig since each of the reaction vessels is closed by the header block and control head (figs. 1-6). Nevertheless, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the reactor of Hutchins et al. to construct the reactor from strong and/or thick materials and/or effectively seal each of the reaction wells to efficiently pump liquids into and out of the reaction wells and accommodate unstable dissolution media and pressurized conditions as required by many assays. Regarding at least 50 psig, 100 psig, or 400 psig, it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art (*In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980)). Regarding between about 500 psig to about 1500 psig, it has been held that discovering optimum or workable ranges involves only routine skill in the art (*In re Aller*, 105 USPQ 233).

It is unclear what the volume of each of the reaction wells is. However, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify

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the reactor of Hutchins et al. to have a volume of not more than about 1 liter or 500 milliliters or between about 1 milliliter to about 100 milliliters to effectively accommodate small-scale assays since a large volume means a large surface area for which a small amount of solid and liquid may attach, such that the solid is not necessarily dispensed into the liquid, and continue the advancement toward miniaturization and duplication of reaction wells for high-throughput and minimization of wastes. Regarding not more than about 1 liter or 500 milliliters, it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art (*In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980)). Regarding between about 1 milliliter to about 100 milliliters, it has been held that discovering optimum or workable ranges involves only routine skill in the art (*In re Aller*, 105 USPQ 233).

Hutchins et al. disclose three feed lines for liquids. Hutchins et al. disclose a tablet dispenser, which may be considered a feed line for the tablet, such that the recitation of a *liquid* feed line is considered a recitation of intended use. A recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. In a claim drawn to a process of making, the intended use must result in a manipulative difference as compared to the prior art. See *In re Casey*, 152 USPQ 235 (CCPQ 1967) and *In re Otto*, 136 USPQ 458, 459 (CCPA 1963). In this case, the feed line for the table is capable of feeding a liquid. No structure has been recited to differentiate a *liquid* feed line from other types of feed lines. Nevertheless, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the reactor of Hutchins et al. to provide additional feed lines for a liquid instead

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of a solid that is to be dissolved into liquid media and additional solvents into which the solid or liquid is dissolved to provide for a reusable reactor for subsequent assays and prevent contamination with the use additional feed lines and provide more than one different liquid media to accelerate dissolution of the liquid or solid.

Hutchins et al. do not explicitly disclose the liquid sources in vessels. However, one would expect that the liquid sources would be contained in vessels. Nevertheless, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the reactor of Hutchins et al. to contain the liquid in vessels to prevent contamination and mess and provide for easy transport and refilling.

Hutchins et al. do not explicitly disclose removable reaction vessels contained in a lower portion of the reaction wells. However, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide removable reaction vessels made from a well known chemically compatible material such as glass in the reaction wells to allow transport of the contents within the vessels to undergo further processing, keep the reaction wells clean to prevent extensive cleaning, and provide a plurality of vessels in a well for high-throughput while allowing one to view the contents within the reaction vessel.

It appears that each of the reaction vessels has an aspect ratio of length to diameter of about 1.5 or even 2 since the length is about twice as great as the diameter. Nevertheless, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the reactor of Hutchins et al. to provide the necessary or desired dimensions of the reaction wells suited for the assay of interest. Furthermore, it has been held that discovering



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an optimum value of a result effective variable involves only routine skill in the art (*In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980)).

Hutchins et al. do not disclose at least eight reaction wells, at least eight reaction vessels, at least eight impellers, and at least eight control heads. However, it would have been obvious to one having ordinary skill in the art at the time the invention was made to duplicate the reaction wells, reaction vessels, impellers, and control heads to provide more simultaneous performing of a greater number of assays in order to increase throughput. Furthermore, it has been held that duplication of the essential working parts of a device involves only routine skill in the art (*St. Regis Paper Co. v. Bemis Co.*, 193 USPQ 8), such that duplicating reaction wells, reaction vessels, impellers, and control heads is within the skill of a routineer.

It appears that each of the liquid feed lines have a substantially circular cross-sectional area. Hutchins et al. do not address the inside diameter of one feed line is less than about 500 micrometers and the inside diameter of another feed line is about 500 micrometers or more. However, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide feed lines with an inside diameter of about 500 micrometers, such that some lines would have an inside diameter of less than 500 micrometers and others would have an inside diameter of more than 500 micrometers due to inherent imperfection in construction, to provide certain necessary or desired conditions for performing an assay effectively and efficiently, such as for controlling ease of flow, flow rates, and volumes of liquids delivered to a reaction vessel.

22. Claims 14-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over EP 0 635 713 to Hutchins et al. in view of U.S. Patent No. 6,083,763 to Balch.

Hutchins et al. do not explicitly disclose that the feed lines are capillaries having an inside diameter of not more than about 1 mm and/or outside diameter of not more than about 1 mm and/or made of fused silica, stainless steel, or polymer. However, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the reactor of Hutchins et al. to provide feed lines in the form of capillaries with inside and outside diameters of not more than about 1mm and made of either fused silica, stainless steel, or polymer simultaneously delivering small volumes at precise locations as taught by Balch (col. 12, line 12-col. 16, line 44).

23. Claim 48 is rejected under 35 U.S.C. 103(a) as being unpatentable over EP 0 635 713 to Hutchins et al. in view of U.S. Patent No. 5,282,543 to Picozza et al. or U.S. Patent No. 6,159,368 to Moring et al.

Hutchins et al. do not explicitly disclose a disposable header gasket with masking regions masking each of the reaction cavities. However, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the reactor of Hutchins et al. to provide the claimed gasket to distribute forces urged upon the gasket and effectively seal the reaction cavities from evaporation and contamination as taught by each of Picozza et al. or Moring et al. Picozza shows a disposable header gasket (50) with masking regions (56) for each reaction cavity (fig. 5). Moring et al. shows a cover the undersurface of which has masking regions (166) for each reaction cavity (figs. 11-15). Since the cover is disposable, the undersurface attached to it would also be disposable. Conceivably one could rip the undersurface and dispose of it.

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24. Claim 57 is rejected under 35 U.S.C. 103(a) as being unpatentable over EP 0 635 713 to Hutchins et al. in view of U.S. Patent No. 6,548,026 to Dales et al. or U.S. Patent No. 6,190,619 to Kilcoin et al.

Hutchins et al. do not explicitly disclose a plurality of modular reactor blocks. However, it would have been obvious to one having ordinary skill in the art to provide additional reactor blocks to conduct more assays as taught by Kales et al. or Kilcoin et al. Furthermore, it has been held that duplication of the essential working parts of a device involves only routine skill in the art (*St. Regis Paper Co. v. Bemis Co.*, 193 USPQ 8), such that duplicating reactor blocks is within the skill of a routineer.

***Allowable Subject Matter***

25. Claims 13, 20, 26 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Elizabeth Quan whose telephone number is (571) 272-1261. The examiner can normally be reached on M-F (8:00-4:30).


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jill Warden can be reached on (571) 272-1267. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Elizabeth Quan  
Examiner  
Art Unit 1743

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